

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (currently amended) A method of mobile communication in ~~which~~between a base station and ~~communicates with a mobile station~~ comprising the steps of:

transmitting a call control information through a call control channel; and for

~~transmitting call control information and through a perch channel for~~

~~transmitting a spread code used for despreading demodulation of said call control~~

~~information through a perch channel, wherein:~~

wherein said perch channel and said call control channel are transmitted to be

~~being arranged relative to each other in a non-overlapping manner~~ in a time base such that an error rate becomes less than or equal to a threshold level when said mobile station receives said call control channel.

2. (currently amended) The method of mobile communication according to Claim 1, wherein: when said perch channel and said call control channel are arranged in the time base, said call control channel and a part that is provided in said perch channel and is not orthogonal to said call control channel in terms of a code are arranged such that the error rate becomes less than or equal to the threshold level when said call control channel is received.

3. (currently amended) The method of mobile communication according to Claim 1, wherein: when said perch channel and said call control channel are arranged, said call control channel is interleaved.

4. (currently amended) A method of mobile communication in ~~which~~between a base station ~~and~~ communicates with a mobile station comprising the steps of:
transmitting a call control information through a call control channel; and for
transmitting call control information and through a perch channel for
transmitting a spread code used for despreading demodulation of said call control
information through a perch channel, wherein:
wherein said perch channel and said call control channel are transmitted,
being to be arranged relative to each other in a non-overlapping manner in a time
base such that said mobile station can demodulate said call control channel.

5. (currently amended) A method of mobile communication in ~~which~~between a base station ~~and~~ communicate with a mobile station comprising the steps of:
transmitting a call control information through a call control channel; and for
transmitting call control information and through a perch channel for
transmitting a spread code used for despreading demodulation of said call control
information through a perch channel, wherein:

wherein said call control channel is transmitted, to be arranged relative to said perch channel in a non-overlapping manner in a time base being power controlled such that said mobile station can demodulate said call control channel.

6. (currently amended) A radio base station comprising:

a first channel generating part for spreading call control information with a first spreading code to generate a call control channel;

a second channel generating part for generating a perch channel that transmits the first spreading code used for despreading modulation of said call control information; and

a channel multiplexing part for multiplexing the call control channel generated by said first channel generating part and the perch channel generated by said second channel generating part by arranging the call control channel and the perch channel relative to each other in a non-overlapping manner in a time base such that said call control channel can be demodulated.

7. (previously presented) The radio base station according to claim 6, wherein said channel multiplexing part arranges, in a time base, said call control channel and said perch channel's part non-orthogonal in terms of a code to said call control channel, such that said call control channel can be demodulated when received.

8. (previously presented) The radio base station according to claim 6, wherein said channel multiplexing part multiplexes said perch channel and the call control channel subjected to interleave.

9. (previously presented) The radio base station according to claim 6, further comprising a control part for controlling transmit power of said call control channel, wherein said control part performs power control such that said call control channel can be demodulated.

10. (currently amended) A method of mobile communication using a CDMA multiplex technique, in which a base station communicates with a mobile station through a traffic channel for transmitting user data and through a perch channel for transmitting a spreading code used for demodulating the user data, wherein:

wherein said traffic channel has a call control channel subjected to time division multiplex, and

wherein said call control channel and a part, that is provided in said perch channel and ~~has~~ does not have orthogonality to other channels, are arranged relative to each other so as not to overlap with each other in a time base.

11. (currently amended) A method of mobile communication using a CDMA multiplex technique, in which a base station communicates with a mobile station through a traffic channel for transmitting user data and through a perch channel for transmitting a spreading code used for demodulating the user data.

wherein said traffic channel has a call control channel subjected to time division multiplex,

wherein said call control channel and a part, that is provided in said perch channel and does not have orthogonality to other channels, are arranged not to overlap with each other in a time base~~The method of mobile communication using a CDMA multiplex technique according to Claim 10, and wherein:~~

wherein said base station controls transmit powers of the perch channel and traffic channel to satisfy:

$$P_u \geq P_p + S I R_r - G_d$$

where P_u is a transmit power of said traffic channel, P_p is a transmit power of said perch channel, $S I R_r$ is a signal to interference power ratio required for receiving the traffic channel without an error, and $G_d = 10 \log$ (spread rate/bit rate of the traffic channel) is a spread gain of the traffic channel.

12. (currently amended) A method of mobile communication using a CDMA multiplex technique, in which a base station communicates with a mobile station through a traffic channel for transmitting user data and through a perch channel for transmitting a spreading code used for demodulating the user data, ~~wherein:~~

wherein said traffic channel is constructed such that said traffic channel has a call control channel subjected to time division multiplex, and a signal of said call control channel and the user data are subjected to time division multiplex and interleaving, and

wherein said call control and said perch channel are transmitted to be arranged relative to each other in a non-overlapping manner in a time base.

13. (currently amended) A method of mobile communication using a CDMA multiplex technique, in which a base station communicates with a mobile station through a traffic channel for transmitting user data and through a perch channel for transmitting a spreading code used for demodulating the user data,

wherein said traffic channel is constructed such that said traffic channel has a call control channel subjected to time division multiplex, and a signal of said call control channel and the user data are subjected to time division multiplex and interleaving. ~~The method of mobile communication using a CDMA multiplex technique according to Claim 12, wherein: and~~

wherein said base station controls a transmit power of the traffic channel to satisfy:

$$P_u \geq P_p + SIRR - G_d$$

where P_u is the transmit power of said traffic channel, P_p is a transmit power of said perch channel, $SIRR$ is a signal to interference power ratio required for receiving the traffic channel without an error, and $G_d = 10 \log (\text{spread rate/bit rate of the traffic channel})$ is a spread gain of the traffic channel.

14. (original) A communication apparatus, comprising:
a control information generating part for generating control information common to a plurality of radio terminal;

a first spreading part for spreading said control information with a first spreading code D1;

a second spreading part for spreading a first specific information with a second spreading code O2 related to a start timing of said first spreading code;

a third spreading part for spreading the control information, which has been spread by said first spreading part, with a third spreading code C1;

a first perch channel generating part for generating a first perch channel by performing time division multiplex with respect to the control information spread by said third spreading part and the specific information spread by said second spreading part;

a fourth spreading part for spreading a second specific information with a fourth spreading code O3 related to a group to which said first spreading code belongs;

a second perch channel generating part for generating a second perch channel by synchronizing the second specific information spread with the fourth spreading code O3 with said first specific information of said first perch channel;

an input part for inputting voice or data;

a multiplexing part for performing time division multiplex with respect to said voice or data and call control information;

a fifth spreading part for spreading said voice or data and call control information subjected to the time division multiplex, using said first spreading code D1;

a sixth spreading part for spreading said voice or data and call control information, which have been subjected to spreading by said fifth spreading part, using a fifth spreading code CN orthogonal to said third spreading code in terms of a code;

a traffic channel generating part for generating a traffic channel including said voice or data and call control information spread with said fifth spreading code; and

a control part for controlling slot offsets of said first perch channel and said traffic channel, such that said first specific information of the first perch channel and said call control information of the traffic channel, generally, do not overlap with each other in a time base.

15. (original) The communication apparatus according to Claim 14, further comprising:

a transmit power control part for controlling a transmit power of said traffic channel, instead of said control part or in addition to said control part.

16. (original) The communication apparatus according to Claim 14, further comprising:

an error correction coding part for performing error correction coding on said call control information or on said voice or data and said call control information, before spreading using said fifth spreading code CN.

17. (original) The communication apparatus according to Claim 15, further comprising:

an error correction coding part for performing error correction coding on said call control information or on said voice or data and said call control information, before spreading using said fifth spreading code CN.

18. (original) A communication apparatus, comprising:

a control information generating part for generating control information common to a plurality of radio terminal;

a first spreading part for spreading said control information with a first spreading code D1;

a second spreading part for spreading a first specific information with a second spreading code O2 related to a start timing of said first spreading code;

a third spreading part for spreading the control information, which has been spread by said first spreading part, with a third spreading code C1;

a first perch channel generating part for generating a first perch channel by performing time division multiplex with respect to the control information spread by said third spreading part and the specific information spread by said second spreading part;

a fourth spreading part for spreading a second specific information with a fourth spreading code O3 related to a group to which said first spreading code belongs;

a second perch channel generating part for generating a second perch channel by synchronizing the second specific information spread with the fourth spreading code O3 with said first specific information of said first perch channel;

an input part for inputting voice or data;

a multiplexing part for performing time division multiplex with respect to said voice or data and the call control information;

an interleaving part for interleaving said voice or data and call control information subjected to said time division multiplex;

a fifth spreading part for spreading said voice or data and call control information subjected to interleaving, using said first spreading code D1;

a sixth spreading part for spreading said voice or data and call control information, which have been subjected to spreading by said fifth spreading part, using a fifth spreading code CN orthogonal to said third spreading code in terms of a code; and

a traffic channel generating part for generating a traffic channel including said voice or data and call control information spread with said fifth spreading code.

19. (original) The communication apparatus according to Claim 18, further comprising:

an error correction coding part for performing error correction coding on said call control information or on said voice or data and said call control information, before the interleaving.

20. (original) A CDMA mobile communication system comprising a plurality of mobile stations and a radio base station communicating with said mobile stations, wherein:

said radio base station comprises:

a control information generating part for generating control information common to said plurality of mobile stations;

a first spreading part for spreading said control information with a first spreading code D1;

a second spreading part for spreading a first specific information with a second spreading code O2 related to a start timing of said first spreading code;

a third spreading part for spreading the control information, which has been spread by said first spreading part, with a third spreading code C1;

a first perch channel generating part for generating a first perch channel by performing time division multiplex with respect to the control information spread by said third spreading part and the specific information spread by said second spreading part;

a fourth spreading part for spreading a second specific information with a fourth spreading code O3 related to a group to which said first spreading code belongs;

a second perch channel generating part for generating a second perch channel by synchronizing the second specific information spread with the fourth spreading code O3 with said first specific information of said first perch channel;

an input part for inputting voice or data;

a multiplexing part for performing time division multiplex with respect to said voice or data and call control information;

a fifth spreading part for spreading said voice or data and call control information subjected to the time division multiplex, using said first spreading code D1;

a sixth spreading part for spreading said voice or data and call control information, which have been subjected to spreading by said fifth spreading part, using a fifth spreading code CN orthogonal to said third spreading code in terms of a code;

a traffic channel generating part for generating a traffic channel including said voice or data and call control information spread with said fifth spreading code CN;

a control part for controlling slot offsets of said first perch channel and said traffic channel, such that said first specific information of the first perch channel and said call control information of the traffic channel, generally, do not overlap with each other in a time base; and

a transmitting part for transmitting said first perch channel, said second perch channel, and said traffic channel;

each of said mobile stations comprises:

a receiving part for receiving said first perch channel, said second perch channel, and said traffic channel;

a first extracting part for extracting said second spreading code O2 from the first perch channel received by said receiving part;

a second extracting part for extracting said fourth spreading code O3 from the second perch channel received by said receiving part;

a third extracting part for extracting said first spreading code based on said second spreading code and said fourth spreading code;

a broadcast information demodulating part for demodulating broadcast information by performing despreading demodulation on said second perch channel using said first spreading code extracted by said third extracting part and said third spreading code C1; and

a call control information demodulating part for demodulating the call control information by performing despreading demodulation on said traffic channel using said first spreading code extracted by said third extracting part and said fifth spreading code CN.